

Amendments to the Specification:

Please amend the specification as follows.

Page 1, please replace the first paragraph with the following amended paragraph:

BACKGROUND OF THE INVENTION

The invention relates to a method for damage limitation in the event of an offset frontal collision between two motor vehicles, and to a motor vehicle having an apparatus which serves for this purpose. An offset frontal collision is to be understood as a frontal collision in which the vehicles move toward one another with directional vectors which are substantially parallel but laterally offset in relation to one another. The collision zone is therefore only a lateral part of the car in front.

Page 3, please replace the first paragraph with the following amended paragraph:

When the collision takes place, an impact torque about the yaw axis acts on the vehicle and ~~throws~~ threatens to throw it off course.

Delete the paragraph bridging Pages 3 and 4 and replace it with the following amended paragraphs:

The invention is consequently based on the object of providing a remedy in these two regards. The aim is to minimize the impact-induced yaw moment and to be able to drive said vehicle further after a collision which did not take place after all.

SUMMARY OF THE INVENTION

According to the invention, this the object is achieved in that at least one of the steerable wheels are is very quickly moved back to the initial position again if either no collision has taken place within a certain time after the collision first signal or if a second signal which is transmitted by a further sensor signals the collision has not taken place after all. which actually occurs, with the initial position being the position which the wheels were in at the time the first signal was transmitted. The wheels are therefore moved back to the initial position in a suitable manner, depending on which of the two situations is present. The initial position is the position at the time at which the first signal predicts a probable collision, because the driver may have made a desperate bid to avoid the imminent collision.

Page 4, please replace the first and second paragraphs with the following amended paragraphs:

The first signal is preferably generated by the direction and distance data which is repetitively recorded by a sensor being evaluated on the basis of criteria and transmitted when the result of the evaluation determines a collision probability which is above a predefined value (claim 2).

The wheels are moved back to When the initial position in different ways, depending on which of the two situations is present: either second sensor (for example a deceleration sensor) determines the collision which actually occurs is determined by a sensor (a deceleration sensor) which and transmits a the second signal in response to which, it is

advantageous for the steerable wheel on the collision side is to be moved back to its initial position and the wheel which is not on the collision side remains to be left turned (claim 3). The wheel which is not on the collision side is moved back to the initial position only when the yaw rate of the vehicle is virtually zero (claim 4). This counteracts the rotation of the vehicle about the yaw axis which is caused by the collision, and prevents a possible secondary collision. When there is a yaw rate sensor, the time for which the wheel which is not on the collision side remains turned can be accurately measured.

Delete the paragraph bridging Pages 4 and 5 and replace it with the following amended paragraph:

In the other situation, in which the collision has not taken place after all, both wheels are moved back to their initial position again if the second signal is not transmitted within a specific period of time (claim 5). The initial position is preferably the position before the first signal (which predicts the probability of a collision) because the driver may have made a desperate bid to avoid the imminent collision. The journey can therefore be continued without obstruction.

Page 5, please replace the first full paragraph and the paragraph bridging Pages 5 and 6 and replace them with the following amended paragraphs:

In one refinement of the method according to the invention, the first signal can trigger the wheels to turn at a time which depends on the speed at which the two vehicles approach one another (claim 6). As a result, the wheels reach the turned position only immediately before the collision.

An inventive motor vehicle with steerable front wheels

and a steering apparatus is distinguished in that at least one reversible actuator with ~~an external~~ a very fast-acting power source is provided in the steering apparatus and influences the turning of the steerable wheels via connecting elements, ~~with the at least one actuator causing the two steered such that the wheels to turn can be turned both~~ in opposite directions ~~on the instructions of a signal (claim 7)~~ and at least one wheel can be moved back to the initial position. Connecting elements are understood to be tie rods, steering arms and/or the like. The important feature is that the actuator is reversible, that is to say it can also return to its initial position again in response to a command. Such an actuator is preferably an electric motor ~~(claim 9)~~ with corresponding conversion and/or transmission means.

Page 6, please delete paragraphs 1-10 and replace them with the following amended paragraphs:

In the preferred embodiment of the invention, two actuators which each have their own external power source are provided, with each actuator being associated with a steerable wheel ~~(claim 8)~~. As a result, it is possible to return the steerable wheels to the initial position in a selective manner.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described and explained below with reference to drawings, in which:

fig Fig. 1: depicts a vehicle according to the invention,

fig Fig. 2: depicts said vehicle in a first phase;

fig Fig. 3: depicts said vehicle in a second phase,
immediately before a collision,

fig Fig. 4: depicts said vehicle in a third phase,

during the collision,

fig Fig. 5: depicts said vehicle in a fourth phase,
immediately after the collision,

fig Fig. 6: depicts said vehicle in a fifth phase, after
the collision,

fig Fig. 7: depicts said vehicle in a fourth phase, but
when no collision has occurred, and

fig Fig. 8: is a diagram relating to fig Fig. 1.

Delete the paragraph bridging Pages 6 and 7 and replace it
with the following amended paragraph:

DETAILED DESCRIPTION

Fig. 1 schematically shows the front part of a motor vehicle which has equipment for executing the method according to the invention. Said front part comprises longitudinal frame supports 1 which adjoin a base plate 2 which for its part is laterally bounded by sills 3. The front end of the motor vehicle is formed by a bumper 4 which follows the front part of the vehicle contour 5 (dashed). An engine/transmission block 6 is merely indicated. Transverse links 8, for example, are guided on suspension supports 7 which are fixed to the longitudinal frame supports or are part of a chassis auxiliary frame. A left-hand front wheel 9 and a right-hand front wheel 10 are suspended in this way.

Page 9, please delete the second paragraph, the paragraph bridging Pages 9 and 10 and the first full paragraph on Page 10 and replace them with the following amended paragraphs:

The situation in fig Fig. 4 is as follows. The vehicles have collided. The contour 32 of the collision partner 31 has already entered the contour of our vehicle and is in contact

with the turned wheel 9. To some extent, this forms a shield which pushes the vehicles apart and thus prevents the front wheels from interengaging. In the process, an impact torque (arrow 26) is exerted on our vehicle about its center of gravity 27. Even at the first moment of the collision, the deceleration sensor has responded and as a result - with a time delay - triggered a further signal to the actuator of the wheel 9 on the collision side. This further signal leads to fig Fig. 5.

In fig Fig. 5, the actuator has moved the wheel 9 back to its original position again, while the wheel 10 which was not involved in the collision remains turned inward. As a result, a torque (arrow 28) acts on the vehicle in the direction of rotation opposite the impact torque 26 from fig Fig. 4. The yawing movement of the vehicle is therefore disrupted given enough time and the vehicle roughly maintains its original course, but with a lateral offset. The risk of subsequent collisions with other vehicles is considerably reduced as a result. The amount of time needed to stop the yawing movement is either calculated by the controller, or a yaw angle sensor which signals this is provided. If this time is reached, the actuator which acts on the wheel 10 which was not involved in the collision is also supplied with the signal to move its wheel 10 back to the original position, see fig Fig. 6.

Fig. 7 alternatively adds to the situation in fig Fig. 3. If, specifically within a certain time following the two wheels being turned inward, no collision has taken place or is expected, that is to say the deceleration sensor 22 does not respond, both actuators are supplied with the further signal to return both turned wheels 9, 10 to their initial position again, and the journey can be continued.